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Highway Traffic Safety Data Overview for Metropolitan Chicago

Update Analysis of 2002, 2005, and 2008 Crash Data

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CMAP Congestion Management Process

2007 Document Prepared by
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Regional Traffic Safety Data Overview
Regional Casualty Rates and Trends

Metropolitan Chicago Motor Vehicle Casualties Fell from 2002 to 2008
The annual number of injuries and fatalities from motor vehicle crashes in the Chicago Region fell 12.5% from 2002 to 2005 and 17.8% from 2005 to 2008. Fatalities fell 6.8% from 2002 to 2005, but decreased 30.5% from 2005 to 2008. Table 1 shows the change in injuries and fatalities for the 7-county area from 2002 to 2005.

Table 1
Injuries and Fatalities from Motor Vehicle Crashes, Chicago Region, by Year

Injury Severity	2002	2005	2008	% Change 2002-2005	% Change 2005-2008
Injury Reported, Not Evident	38,296	31,710	26,375	-17.2%	-16.8%
Non-Incapacitating Injuries	36,453	32,842	28,320	-9.9%	-13.8%
Incapacitating Injuries	11,061	10,515	7,087	-4.9%	-32.6%
Fatalities	675	629	437	-6.8%	-30.5%
Total Injuries and Fatalities	86,485	75,696	62,219	-12.5%	-17.8%

Sources: IDOT, CMAP

Fatality and Injury Rates Also Fell
Traffic crashes are a function of ***risk*** and ***exposure*** to that risk. Exposure to motor vehicle crash risk rose from 2002 to 2005: population and vehicle miles traveled (VMT) grew moderately. For the period through 2008, population continued to grow through 2008, but vehicle miles traveled declined. Risk can be measured either from a public health (crashes per population) or mobility perspective (crashes per million miles of travel). From 2002 to 2008, crash risks fell both from a public health and mobility perspective. Fatalities per hundred thousand people fell 7.8% between 2002 and 2005, and fell a further 31.5% from 2005 to 2008. From 2002 to 2005, fatalities per hundred million VMT fell 9.6% and from 2005 to 2008 fell 28.7%. See Table 2 for a summary.

Table 2
Chicago Region Motor Vehicle Injury Rates, 2002, 2005 and 2008

Measure	2002	2005	2008	% Change 2002-2005	% Change 2005-2008
Fatalities per Hundred Million VMT	1.15	1.04	0.74	-9.6%	-28.7%
Fatalities per Hundred Thousand Population	8.15	7.51	5.14	-7.8%	-31.5%
Non-Fatal Injuries per Hundred Million VMT	146	124	105	-14.8%	-15.7%
Non-Fatal Injuries per Hundred Thousand Population	1,036	897	727	-13.4%	-19.0%
Population (Thousands)	8,282	8,370	8,494	1.1%	1.5%
Annual VMT (Billions)	58.9	60.5	59.1	2.7%	-2.4%

Sources: IDOT, CMAP, U.S. Census

Regional Traffic Safety Data Overview
Fatality Rates and Trends by Subarea

Regional death rates from motor vehicles crashes in metropolitan Chicago fell 38.3% from 2002 to 2008. At 0.74 fatalities per hundred million VMT, the Chicago region is now well below the 2008 national target of 1.00 fatalities per hundred million VMT (urban areas generally have lower death rates from motor vehicle crashes).

Analysis of Motor Vehicle Fatalities by Chicago Region Subarea
Every county in the region had large reductions in the fatality rate measures between 20002 and 2008. The area with the lowest fatality rates, in terms of both VMT and population, was DuPage County, though fatalities and fatality rates both rose in 2005 and then fell in 2008. For VMT and population measures, suburban Cook County and Lake County had the second lowest fatality rates for 2008.

Based on population, Chicago, with shorter trips and lower automotive mode share than the rest of the region, had the second lowest motor vehicle fatality rate for 2005. Conversely, for 2008, the fatality rate per population in Chicago was above the average for the region. Nearly 25% of Chicago's motor vehicle fatalities involve pedestrians. These crashes are affected by different factors compared to other motor vehicle crashes.

Areas with the highest fatality rates per population include those with substantial rural road infrastructure, particularly McHenry , Kane, Will and Kendall Counties. In these counties, motor vehicle fatality rates are higher than the more densely populated areas, but they are declining.

From 2002 to 2008, population- and VMT-based motor vehicle fatality rates fell in every county. The rates tended to decrease more from 2005 to 2008 than from 2002 to 2005.

Table 3
Motor Vehicle Fatalities, Chicago Region, 2002, 2005 and 2008, by Subarea

Subarea	Fatalities			Fatalities per 100 Million VMT			Fatalities per 100,000 Population		
	2002	2005	2008	2002	2005	2008	2002	2005	2008
Chicago	232	191	166	1.85	1.52	1.42	8.05	6.79	5.87
Suburban Cook	194	187	106	0.90	0.86	0.50	7.84	7.65	4.37
DuPage County	40	56	25	0.47	0.65	0.30	4.35	6.07	2.70
Kane County	39	35	38	1.15	0.99	1.05	8.86	7.36	7.54
Kendall County	17	17	12	2.89	2.48	1.56	27.53	21.50	11.82
Lake County	61	60	29	1.05	1.03	0.51	9.08	8.67	4.10
McHenry County	36	30	18	1.76	1.40	0.83	12.94	9.94	5.66
Will County	56	53	43	1.27	1.00	0.75	10.08	8.39	6.33
Region	675	629	437	1.15	1.04	0.74	8.15	7.51	5.14

Sources: IDOT, CMAP

Regional Traffic Safety Data Overview
Non-fatal Injury Rates and Trends by Subarea

Analysis of Motor Vehicle Injuries by Chicago Region Subarea
Excluding Chicago, fatality rates are highest in rural counties, but urban counties have the highest motor vehicle non-fatal injury rates. Urban counties exhibit congestion and vehicle conflicts that result in greater numbers of crashes, but these crashes, on average, tend to be less deadly than rural crashes on high-speed roads.

From 2002 to 2008, non-fatal injuries declined in all but Kendall County, where suburbanization is leading to more crashes. However, in all of the counties, both of the crash risk measurements below declined over the period. For each area, the injury per population for 2008 is lower than the regional average in 2005.

The City of Chicago injury rates per million VMT fell by 30% from 2002 to 2008, faster than in other areas of the region, with the exception of Will County. However, Chicago injury rates per million VMT are still substantially higher than the rest of the region. From the population risk perspective, high Chicago VMT risk is mitigated by shorter trips and alternatives to the automobile, so that Chicago is below suburban Cook County in injury rates per 100,000 population.

Table 4
Non-fatal Injuries from Motor Vehicle Crashes, Chicago Region, 2002, 2005 and 2008, by Subarea

Subarea	Non-fatal Injuries			Non-fatal Injuries per 100 Million VMT			Non-fatal Injuries per 100,000 Population		
	2002	2005	2008	2002	2005	2008	2002	2005	2008
Chicago	32,639	25,940	21,315	260	206	183	1,133	918	753
Suburban Cook	25,696	23,483	18,971	119	108	90	1,039	976	782
DuPage County	9,088	7,746	6,515	107	89	77	989	840	703
Kane County	4,501	4,472	3,496	133	127	96	1,023	941	694
Kendall County	517	664	614	88	97	80	837	840	605
Lake County	6,243	5,720	4,720	107	98	84	930	827	667
McHenry County	2,419	2,212	1,938	118	103	89	869	733	609
Will County	4,707	4,830	4,213	107	91	74	847	765	620
Region	85,810	75,067	61,782	146	124	105	1,036	897	727

Sources: IDOT, CMAP

Regional Traffic Safety Data Overview
Regional Crash Rates and Trends

Metropolitan Chicago Motor Vehicle Crashes Fell from 2002 to 2008
In addition to measuring trends and rates of injuries and fatalities, we have also measured the trends and rates of the crashes that cause those casualties. Table 5 shows that total crashes in seven-county metropolitan Chicago fell 4.1% between 2002 and 2005 and 4.2% between 2005 and 2008. Between 2002 and 2008 crashes that cause one or more injuries dropped 23.7% and crashes with fatalities dropped 33.5%. Crashes with property damage only dropped 4.4%. One possible explanation of this trend is the improvements of safety features of vehicles, so that a crash that would have caused injuries in 2002 might have caused only property damage in 2008. Still, lower total crashes point to highway safety or driver behavior improvements.

Table 5
Motor Vehicle Crashes, Chicago Region, 2002, 2005 and 2008

Most Harmful Event in Crash	Motor Vehicle Crashes			% Change 2002-2005	% Change 2005-2008
	2002	2005	2008		
Crashes with Property Damage Only	250,542	243,419	239,591	-2.8%	-1.6%
Injury Crash	58,853	53,324	44,889	-9.4%	-15.8%
Fatal Crash	606	579	409	-4.5%	-29.4%
Total Crashes	310,001	297,322	284,889	-4.1%	-4.2%

Sources: IDOT, CMAP

Crash rates per hundred million VMT and per hundred thousand people in Table 6 show that, after adjusting for exposure, crash risks are falling. Still, on average, a crash occurred every 1 minute 51 seconds in 2008. A fatal crash occurred every 21 hours 25 minutes.

Table 6
Chicago Region Motor Vehicle Crash Rates, 2002, 2005 and 2008, Summary

Measure	2002	2005	2008	Change 2002 -2005	Change 2005-2008
Crashes per Hundred Million VMT	526	491	482	-6.6%	-1.9%
Crashes per Hundred Thousand Population	3,743	3,552	3,354	-5.1%	-5.7%
Time between Crashes	1 minute, 41 seconds	1 minute, 46 seconds	1 minute, 51 seconds	5 seconds	5 seconds
Time between Injury Crashes	8 minutes, 55 seconds	9 minutes, 51 seconds	11 minutes, 43 seconds	56 seconds	1 minute, 52 seconds
Time between Fatal Crashes	14 hours, 27 minutes	15 hours, 7 minutes	21 hours, 25 minutes	40 minutes	6 hours, 18 minutes

Sources: IDOT, CMAP, U.S. Census

Regional Traffic Safety Data Overview
Crash Rates and Trends by Subarea

Analysis of Motor Vehicle Crashes by Subarea
Crash rates vary widely by subarea in the Chicago region. The greatest declines in crashes and crash rates between 2002 and 2008 took place in the City of Chicago, but the crash rates are still highest in the City of Chicago and, based on crashes per VMT, are three times the rate of some of the more rural areas.

Suburbanization is leading to higher crash rates in Kendall, Lake and Will Counties, but these crash rate remains low relative to the rest of the region.

In the remainder of the region, crash rates remained relatively stable between 2002 and 2008. Overall, the crash rate has fallen much less than the injury and fatality rates for the subareas in the region.

Table 7
Motor Vehicle Crashes, Chicago Region, 2002, 2005 and 2008, by Subarea

Subarea	Total Crashes			Crashes per 100 Million VMT			Crashes per 100,000 Population		
	2002	2005	2008	2002	2005	2008	2002	2005	2008
Chicago	136,920	119,059	111,702	1,089	945	957	4,752	4,215	3,947
Suburban Cook	88,853	90,109	85,5122	411	414	406	3,591	3,687	3,524
DuPage County	28,971	29,206	28,257	340	337	335	3,153	3,166	3,047
Kane County	13,432	14,279	13,487	396	406	372	3,052	3,004	2,676
Kendall County	1,494	2,093	2,301	254	306	300	2,419	2,648	2,267
Lake County	19,267	19,112	19,382	332	328	344	2,869	2,763	2,739
McHenry County	7,144	7,216	7,167	348	336	331	2,568	2,391	2,253
Will County	13,920	16,248	17,081	316	307	299	2,506	2,573	2,515
Region	310,001	297,322	284,889	526	491	482	3,743	3,552	3,354

Sources: IDOT, CMAP

Regional Traffic Safety Data Overview
Focus on Late-Night Fatalities

Large Portion of Motor Vehicle Fatalities Occur Late at Night
"Late-night" travel, between 10 p.m. and 5 a.m., is only 11% of regional VMT. Despite being such a small part of travel, in 2008, late-night motor vehicle fatalities comprised 35.8 percent of all motor vehicle fatalities in the region. In Chicago, late-night 2008 fatalities accounted for 46% of all motor vehicle fatalities, even after falling 25% from 2002 levels (see Table 8).

CMAP estimates that the fatality rate for late night travel in the Chicago region for 2005 was as high as 3.14 per hundred million late-night VMT, or more than three times the overall regional rate of 1.04 fatalities per hundred million VMT. An analysis of 2002 data demonstrated even higher rates spiking immediately after midnight, particularly during the weekend. Clearly, late-night travel is riskier than other regional travel.

The dramatic reductions in traffic fatalities between 2002 and 2008 is not due to a disproportionate change in the late-night traffic fatalities. These crashes still account for about 36% of all traffic fatalities.

Causes of higher late-night fatality rates may include drowsiness and slower reaction time, intoxication, and higher uncongested speeds on area freeways. Many of these factors need to be addressed through driver behavior, perhaps through education or enforcement. Poor visibility may also be a factor on late-night crashes, particularly for pedestrian crashes. Visibility might be addressed through advanced illumination techniques.

Table 8
Late Night Motor Vehicle Fatalities, Chicago Region, 2002 , 2005 and 2008, by Subarea

Subarea	Fatalities between 10 pm and 5 am			%Change 2002-2008	Late-Night As Percent of Total Fatalities (2002)	Late-Night As Percent of Total Fatalities (2005)	Late-Night As Percent of Total Fatalities (2008)
	2002	2005	2008				
Chicago	101	79	76	-25%	43.5%	41.4%	45.8%
Suburban Cook	69	63	34	-51%	35.6%	33.7%	32.1%
DuPage County	17	14	3	-82%	42.5%	25.0%	12.0%
Kane County	10	7	13	30%	25.6%	20.0%	34.2%
Kendall County	3	4	5	67%	17.6%	23.5%	41.7%
Lake County	18	20	5	-72%	29.5%	33.3%	17.2%
McHenry County	14	9	2	-86%	38.9%	30.0%	11.1%
Will County	13	15	19	46%	23.2%	28.3%	43.2%
Region	245	211	157	-36%	36.3%	33.5%	35.8%

Sources: IDOT, CMAP

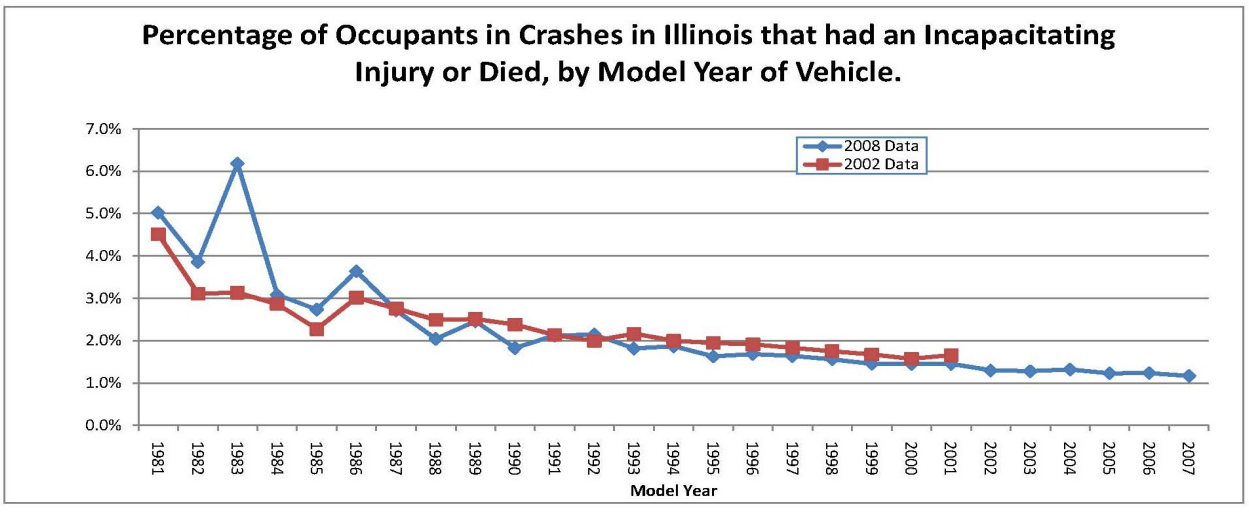
Regional Traffic Safety Data Overview
Serious Injury Rate by Model Year of Vehicle

Analysis of Serious Injury Rate by Model Year
The dramatic reduction in serious crashes that has occurred between 2002 and 2008 should be examined in some detail. Between 2002 and 2008, the crash rate for the region has fallen by 8%, but the fatalities have fallen by 35%, serious injury rates have fallen by 36% and minor injuries have fallen by 27%. It is obvious that severe crashes are being reduced faster than the over-all crash rate.

The reduction in serious crashes is due to many factors. There have been substantial efforts to enforce seatbelt laws and DUI laws. The Illinois Department of Transportation and many local agencies have aggressively sought to address roadway hazards. Economic conditions have resulted in fewer vehicles on the roads. Cell phones and in-car emergency communication devices are more common and may result in faster emergency response times. As has been mentioned in an earlier section of this report, new vehicles are safer than older vehicles due to improvements in air bags, anti-lock brakes, and enhanced crash zones on cars.

It is difficult to measure the effects of many of these efforts, but the safety record of each vehicle model year can be tracked. In Table 9, the percentage of vehicle occupants in Illinois who were seriously injured or killed in a crash is shown for each model year, and is charted for both 2002 and 2008. For the 2008 data, the newer model year vehicles had fewer vehicle occupants who sustained serious injuries. For example, compared to the 1993 vehicles, the 2007 vehicles had 45% fewer serious injuries per occupant. Compared to the 2000 vehicles, the 2007 vehicles has 19% fewer serious injuries per occupant.

Table 9
Share of Occupants that with Serious injuries or Fatalities by Model Year, Illinois, 2002 and 2008



Sources: IDOT, CMAP

Analysis of the 2002 data reveals that the older model year vehicles, compared to newer models, do not have a higher rate of serious injuries because the vehicles have aged. For the model years between 1993 and 2001, the serious injury rate was higher in 2002 (when these vehicles were newer) than in 2008.

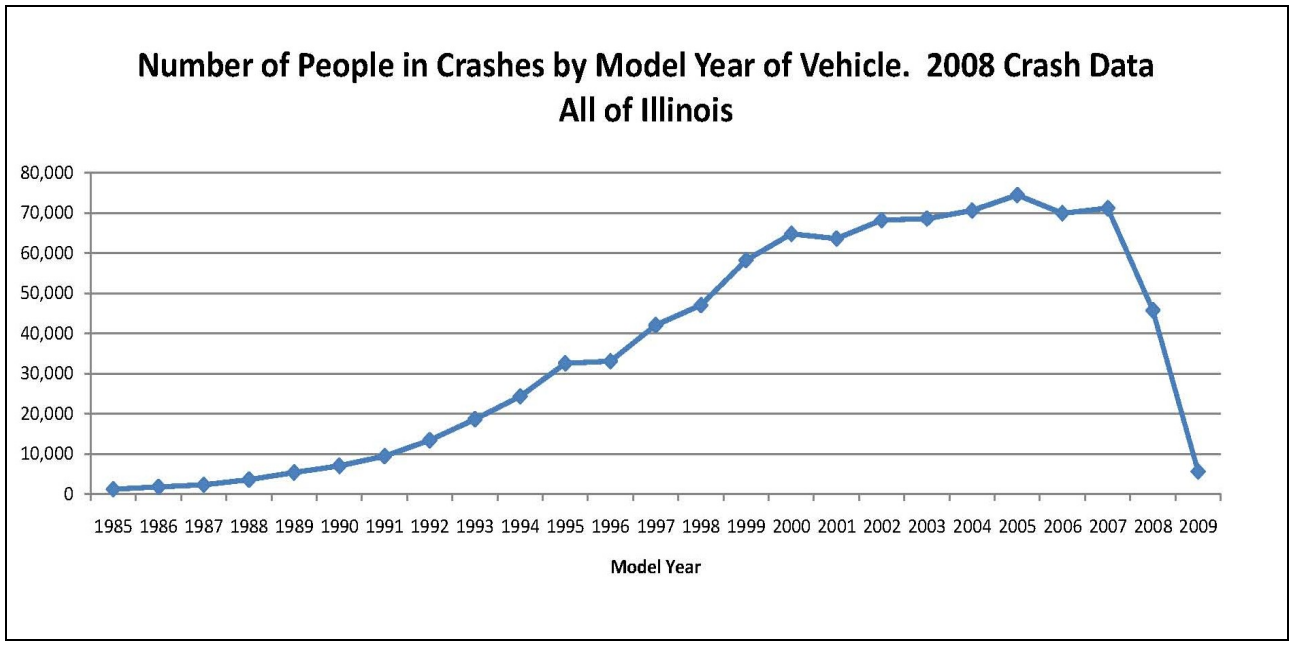
Examining the 2002 and 2008 data may reveal the effect of non-vehicle related safety efforts. Over the 15 model years between 1987 and 2001, the average percentage of occupants who were seriously injured was 2.05% in 2002 and 1.86% in 2008. This is a decrease of 9.5% in the share of occupants that are seriously injured. It could be assumed that this increase in safety is due to enforcement efforts and improved road conditions since the cars are the same, or possibly less safe due to age.

Analysis of Injury Totals by Model Year

The newer model year vehicles account for the most injuries and the most VMT. After about eight full years on the road, the vehicles begin to represent smaller shares of the VMT and crashes. The newer, safer vehicles that came into use over the six years in this analysis had a significant impact on the reduction of serious crashes in the Chicago region since 2002.

Table 10

Number of People in Crashes by Model Year, Illinois, 2008



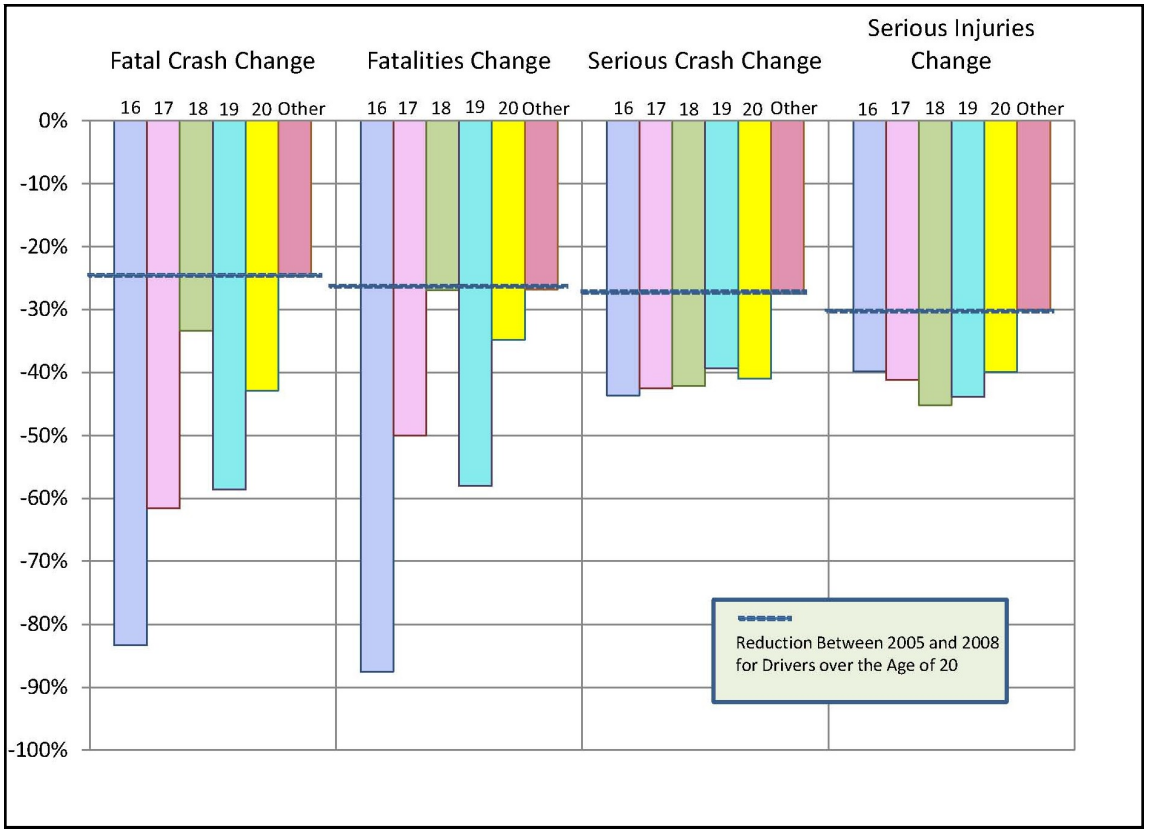
Sources: IDOT, CMAP

Analysis of Serious Crashes in Northeastern Illinois by the Age of the Youngest Driver in the Crash

There has been a significant effort in Illinois to reduce the number of people who are injured or killed in traffic crashes involving young drivers. In 2008, Illinois strengthened its graduated license program. As a consequence, serious and fatal crashes involving teenage drivers fell at a faster rate than crashes without teenage drivers. Table 12 shows the results from both a crash and casualty perspective. The number of crashes with serious injuries was reduced by over 39% for all young driver groups compared with a 28% reduction for crashes in which all of the drivers were over 20 years old*. The number of fatal crashes also fell disproportionately for young driver groups, with the 16 and 17 year old drivers experiencing the greatest reductions.

Table 12

The Percentage Change of Serious and Fatal Crashes and Casualties between 2005 and 2008 by the Age of the Youngest Driver in the Crash, Chicago Region



Sources: IDOT, CMAP

*This group also includes crashes in which a drivers age is unknown. For Chicago area 2008 data 11.3% of the driver records were missing age information compared to 13.9% in 2005. If any driver in a crash was known to be between 15 and 20 years of age, then the crash was allocated to the young driver category.

Regional Traffic Safety Data Overview
Young Driver Crash Rates

In absolute numbers, comparing 2008 to 2005, there were 51 fewer fatal crashes involving drivers under the age of 21 and these crashes resulted in 53 fewer fatalities. There were 685 fewer serious crashes involving young drivers in 2008 compared to 2005, and these crashes caused 954 fewer serious injuries. The overall serious and fatal crash rates have dropped significantly in the Chicago region between 2005 and 2008 and for crashes involving young drivers, the decrease has been even more dramatic.

Table 13
The Number of Serious and Fatal Crashes 2005 and 2008 by the Age of the Youngest Driver in the Crash, Chicago Region

Age of Youngest Driver in Crash	Fatal Crashes				Serious Crashes			
	2005	2008	Change	% Change	2005	2008	Change	% Change
15	1	1	0	0%	16	17	1	6%
16	12	2	-10	-83%	220	124	-96	-44%
17	13	5	-8	-62%	320	184	-136	-43%
18	21	14	-7	-33%	399	231	-168	-42%
19	29	12	-17	-59%	356	216	-140	-39%
20	21	12	-9	-43%	356	210	-146	-41%
Over20/Unknown	482	363	-119	-25%	6,526	4,730	-1796	-28%
Chicago Region	579	409	-170	-29%	8,193	5,712	-2481	-30%

Sources: IDOT, CMAP

Table 14
The Number of Fatalities and Serious Injuries 2005 and 2008 by the Age of the Youngest Driver in the Crash, Chicago Region

Age of Youngest Driver in Crash	Fatalities				Serious Injuries			
	2005	2008	Change	% Change	2005	2008	Change	% Change
15	1	2	1	100%	20	23	3	15%
16	16	2	-14	-88%	289	174	-115	-40%
17	14	7	-7	-50%	430	253	-177	-41%
18	26	19	-7	-27%	562	308	-254	-45%
19	31	13	-18	-58%	495	278	-217	-44%
20	23	15	-8	-35%	486	292	-194	-40%
Over20/Unknown	518	379	-139	-27%	8,233	5,759	-2,474	-30%
Chicago Region	629	437	-192	-31%	10,515	7,087	-3,428	-33%

Sources: IDOT, CMAP

Analysis of Seat Belt Use in Serious and Fatal Crashes

The is a little information on the use of seat belts for occupants in crashes where they were seriously injured or killed. There is information on seatbelt use for about two-thirds of the occupants in serious crashes, and the information is often self reported and may be suspect. Considering only the crashes with information on seatbelt use, in 2002, 84% of the occupants who were seriously injured or killed were wearing a seatbelt. For both 2005 and 2008, 90% of the seriously injured and killed were wearing seatbelts. Considering only fatalities, 40% of the occupants who died in 2002 were wearing seatbelts. For 2005 and 2008, 51% of the fatalities were wearing seatbelts*.

Population and VMT by Subarea

The safety analysis included subarea crash and casualty rates per hundred million VMT and population. The population and VMT estimates used to calculate these rates are given below.

Table 11
Population and VMT by Subarea

Subarea	Annual VMT (Millions)			Population (Thousands)			VMT within Subarea per Resident (2008)
	2002	2005	2008	2002	2005	2008	
Chicago	12,572	12,602	11,671	2,881	2,825	2,830	4,123
Suburban Cook	21,605	21,769	21,078	2,474	2,444	2,427	8,684
DuPage County	8,519	8,675	8,442	919	923	927	9,098
Kane County	3,391	3,520	3,627	440	475	504	7,188
Kendall County	588	685	768	62	79	101	7,529
Lake County	5,809	5,829	5,637	671	692	708	7,960
McHenry County	2,050	2,146	2,168	278	302	318	6,804
Will County	4,410	5,301	5,712	556	631	679	8,405
Region	58,945	60,527	59,104	8,282	8,370	8,494	6,955

Sources: IDOT, CMAP

*These calculations are based only on the occupants of vehicles where the status of the use of seatbelts was known.. All other records were removed from the calculations.

CMAP Congestion Management Process
Chicago Metropolitan Agency for Planning (CMAP) was established in 2006 to integrate planning for transportation and land use in the seven metropolitan Chicago counties of Cook, DuPage, Kane, Kendall, Lake, McHenry, and Will. CMAP's transportation initiatives include a congestion management process that addresses highway safety among other highway performance issues.

This report is one of a series of CMAP reports addressing highway safety. These analyses will take advantage of all crashes for 2005 and succeeding years being geocoded in a new IDOT initiative to provide data to support safety initiatives.

An in-depth 2005 analysis of 2002 data is posted at
http://catsmpo.com/PUB/reports/traffic_safety/safety_analysis_final_report.pdf